WASI Training IV: Review of campaign 2018

Peter Gege
DLR, Earth Observation Center, Remote Sensing Technology Institute, Oberpfaffenhofen, 82234 Wessling, Germany. peter.gege@dlr.de

Project MONEO-WET
Sierpe, Costa Rica, 12-22 March 2019

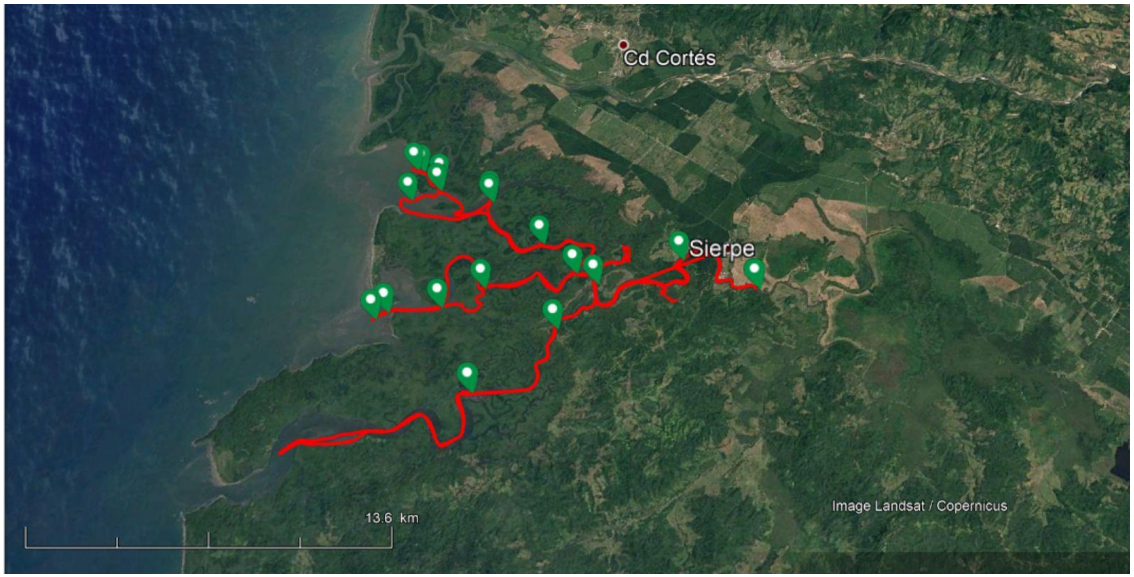
Field data set 2018

Field data set 2018
GPS

GPS

Global positioning system

- 2 systems (CENAT, Peter‘s smartphone)
- track
- sampling points



Field data set 2018

Videos from DJI drone

DJI drone

- DJI ...
- Camera: DJI FC300X
- operated by CENAT

Used for documentation

- Survey of test area
- Videos for Public Relations

Field data set 2018
Photos from OMD

Camera

- Olympus OMD EM-5 Mark 2 (private)
- Fisheye 7.5 mm for water and sky
- Zoom 14-100 mm else
- *The photos were later geo-tagged*

Used for documentation

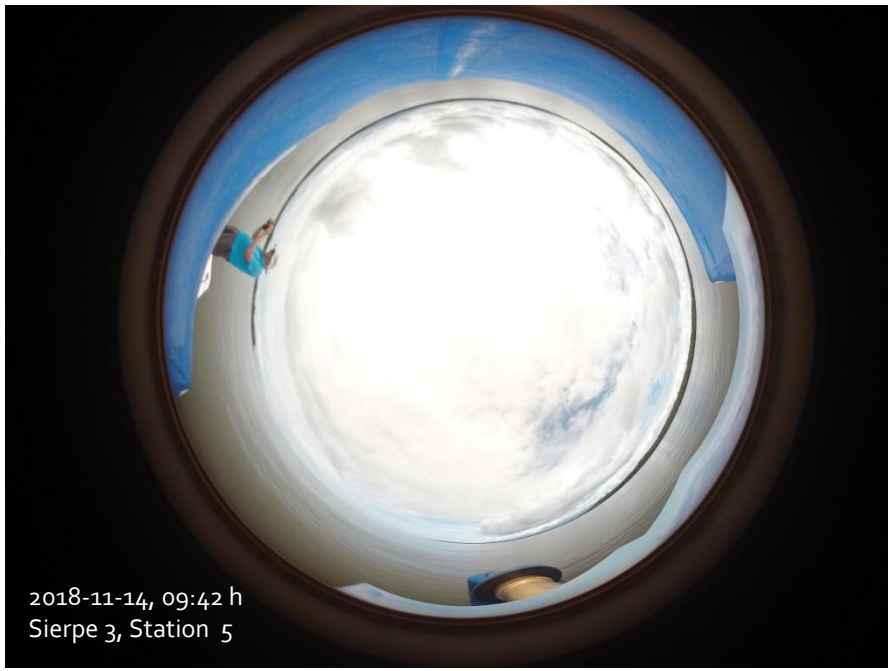
- Measurement procedures
- Sky conditions
- Water conditions
  - surface (waves, floating material)
  - colour

Field data set
Photos from GoSI

GoSI

GoPro Sky Imager

- GoPro Hero 5 with 270° lens
- Mounted on roof of ship
- Every 10 sec a picture
- *Date and time were later corrected*



Used for documentation

- Change of illumination during day
- Sky conditions during measurement

Field data set 2018
Photos from Hero 3

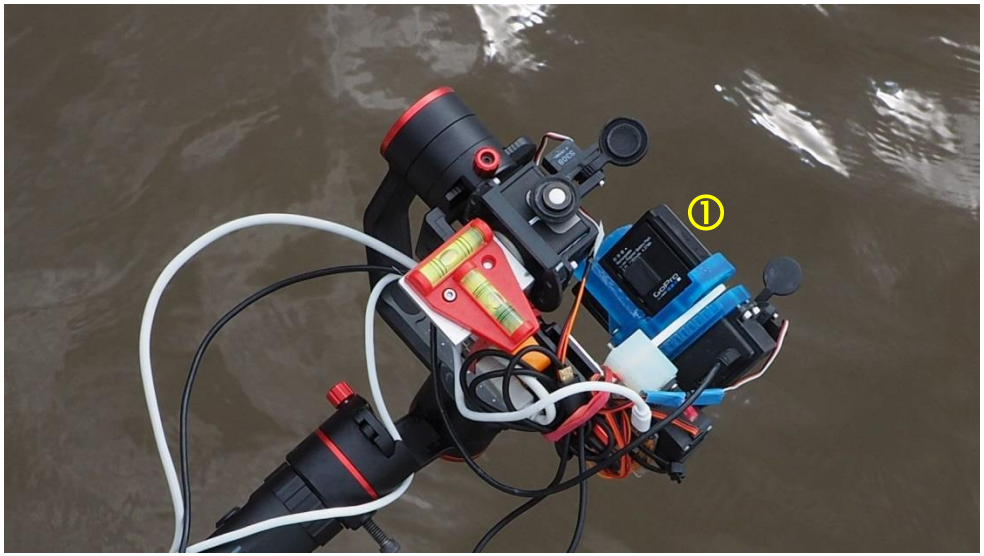
Hero 3

GoPro Hero 3

- Mounted on OOSS ①
- Manually operated
- *Date and time were later corrected*
- *The photos were later geo-tagged*

Used for documentation

- Target during spectral measurement
  - reference panel
  - water surface (reflections, colour)
  - floating material



Field data set 2018
Water clarity and depth

Secchi disk

- Water transparency
- Water depth

Field data set 2018
Water constituents

symbolic photo
other spectrometer will be used

Laboratory analysis

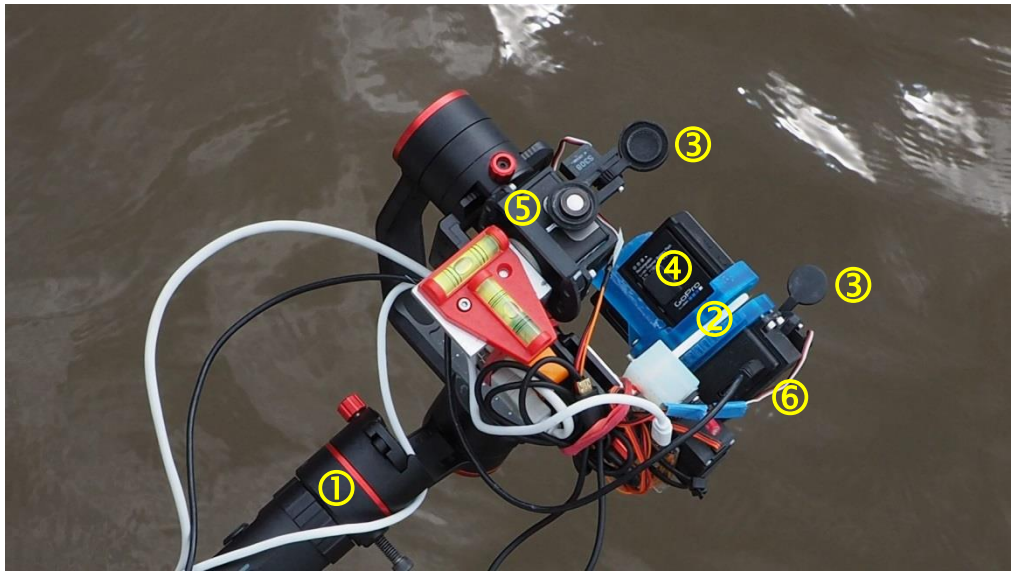
- Chlorophyll-a concentration
- TSM (total suspended matter) concentration
- TSM extinction coefficient (350 – 900 nm)
- CDOM (colored dissolved organic matter) absorption coefficient (200 – 900 nm)

Field data set 2018
Spectra from OOSS

OOSS

Ocean Optics Sensor System

- gimble for horizontal alignment ①
- step motor to adjust viewing angle ②
- 2 shutters for dark current ③
- Hero 3 camera for documentation ④



Used for spectral measurements

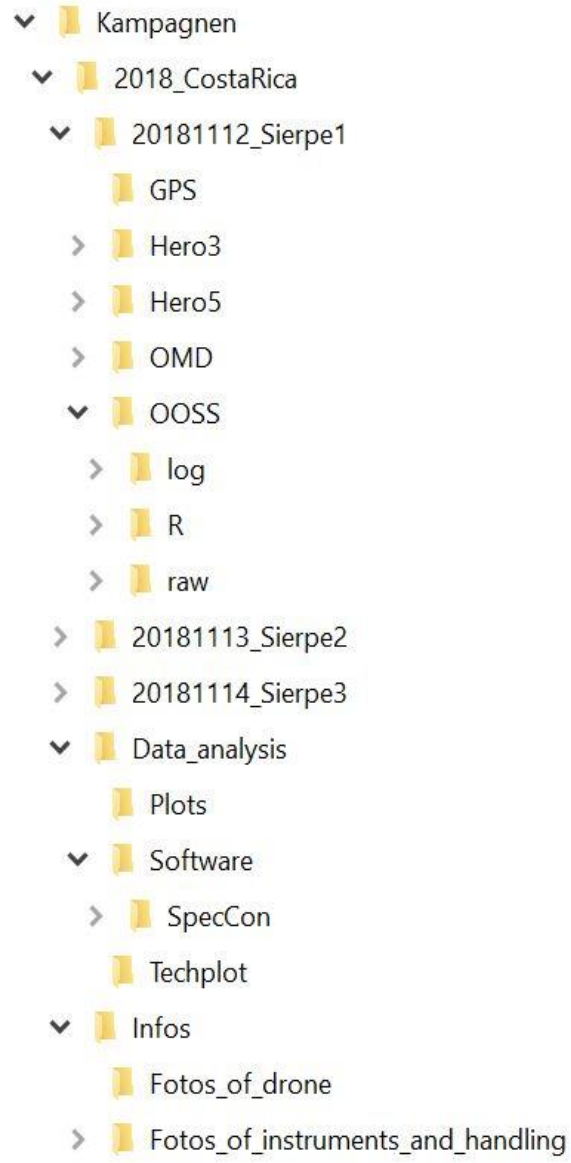
- Ed sensor for downwelling irradiance ⑤
- Lu sensor for upwelling radiance ⑥
  - reference panel
  - water surface

Field data set 2018
Structure of data archive

Directory structure

Directory „2018_CostaRica“

- Subdirectory for each day
  - Subdirectory for each instrument
- Subdirectory for common infos
- Subdirectory for data analysis



Procedures

Correct date and time of photos

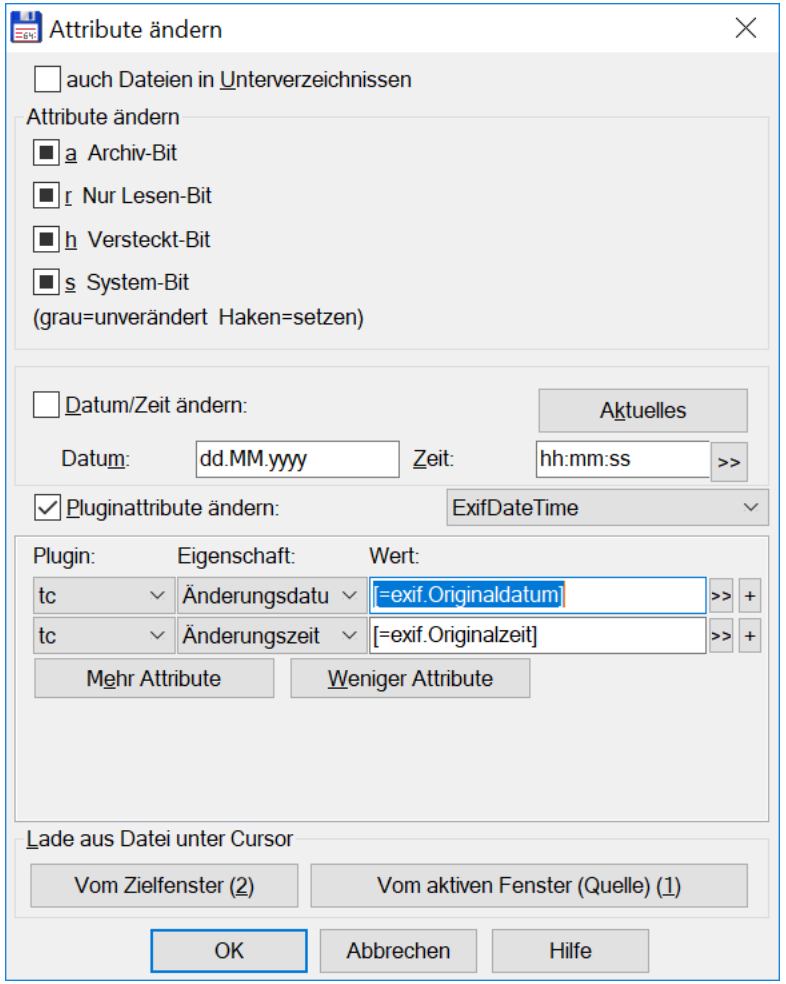
Set file date to date from EXIF

Problem

File date may be changed during copy process (e.g. using USB cable for data transfer from camera to PC)

Total Commander

- Plugin „Exif“
- Dateien – Dateiattribute ändern – Pluginattribute ändern - ExifDateTime

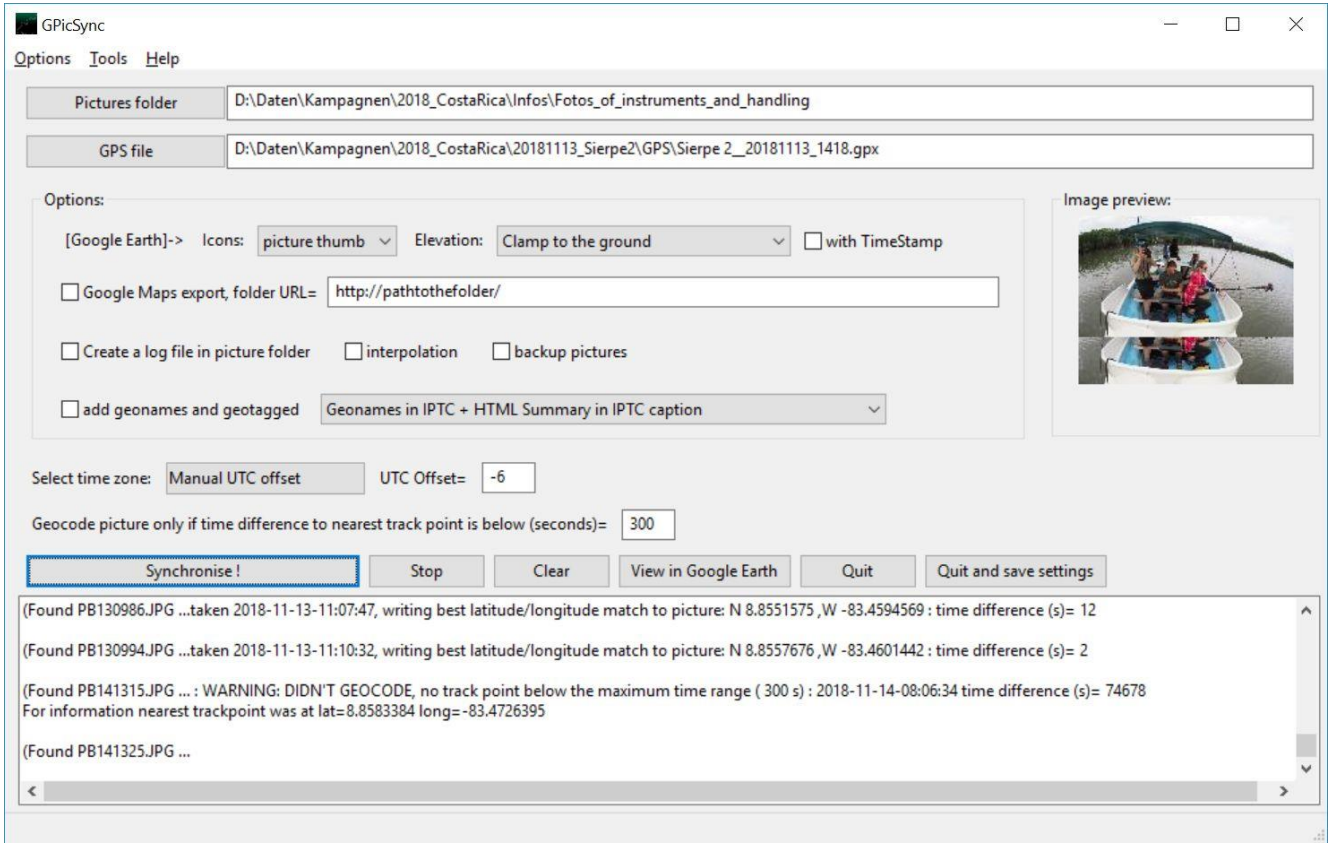


Geotag OMD photos

Add geo-information to EXIF

GPicSync (alternative: GeoSetter)

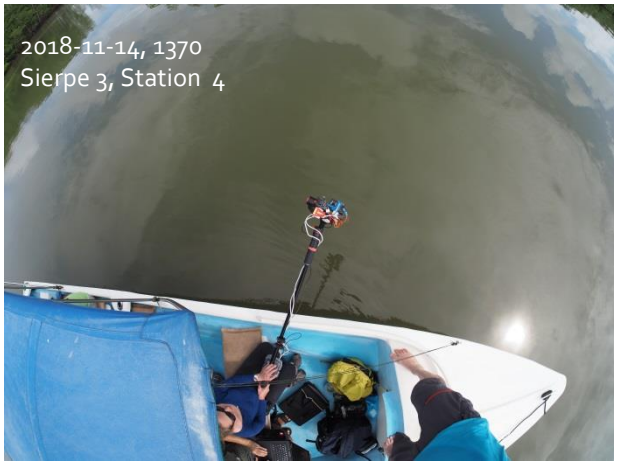
- Set UTC Offset = -6



Results

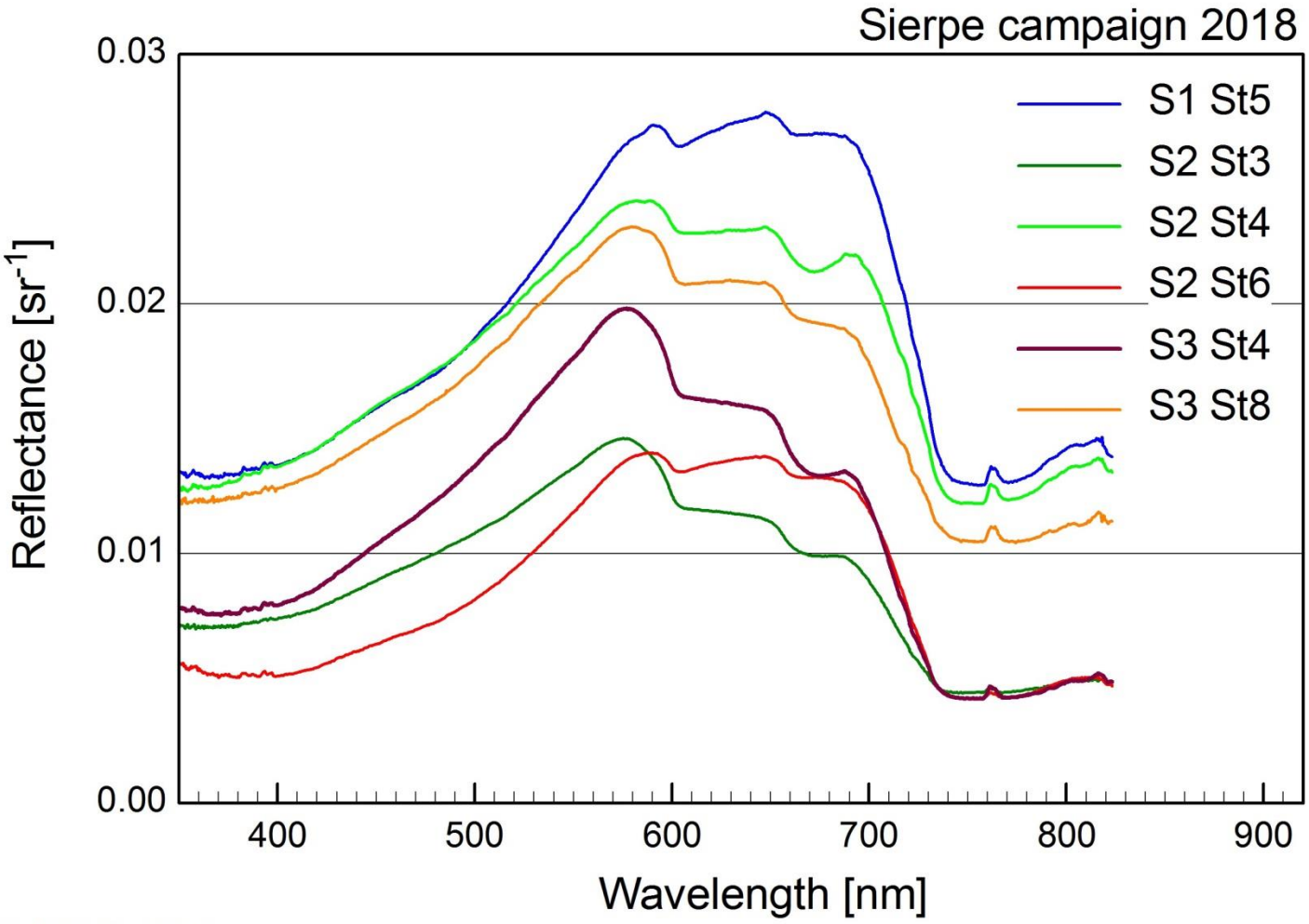
Results

Variety of water colour



Results

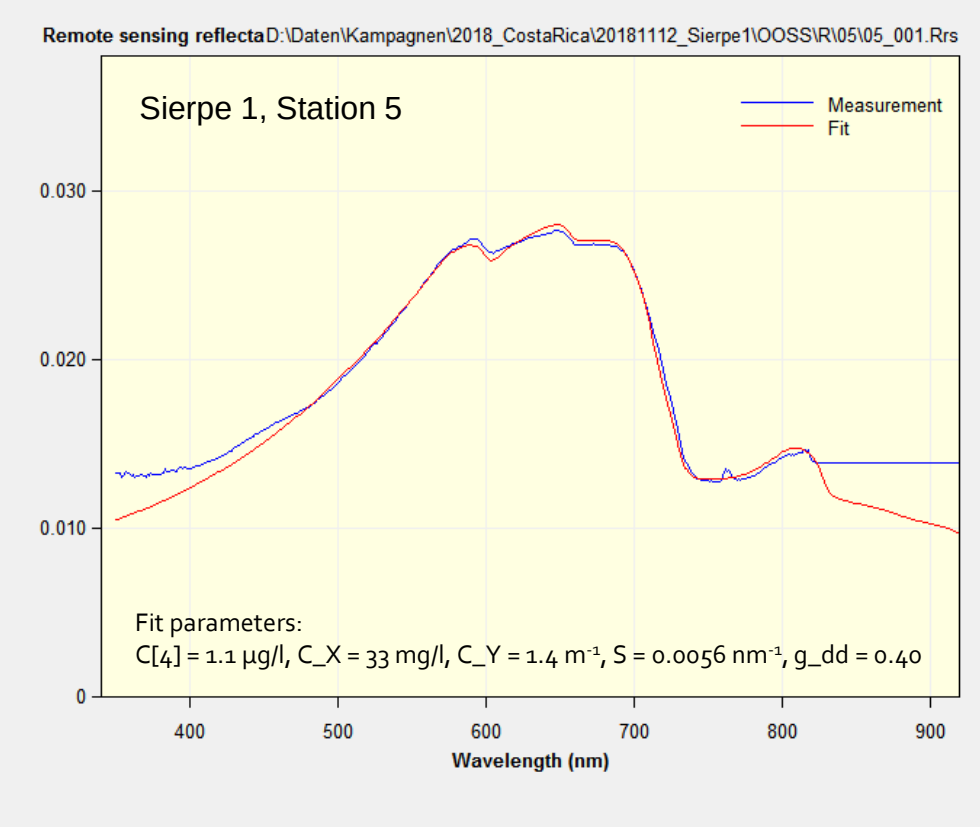
Variety of reflectance

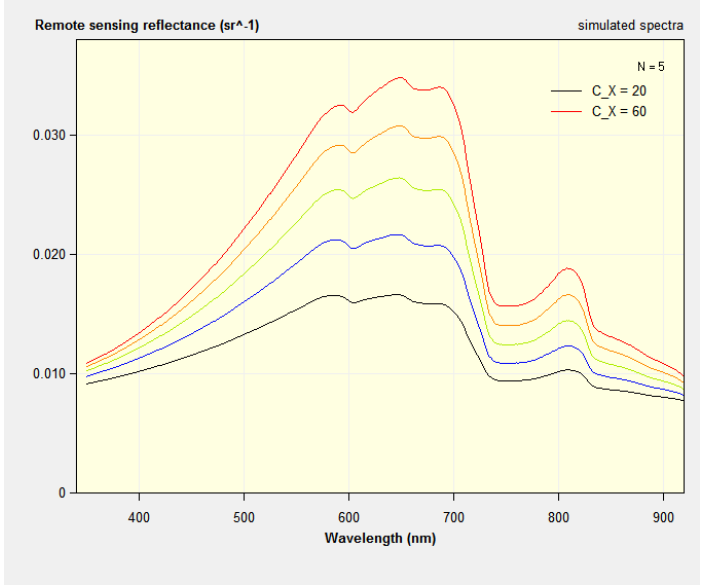


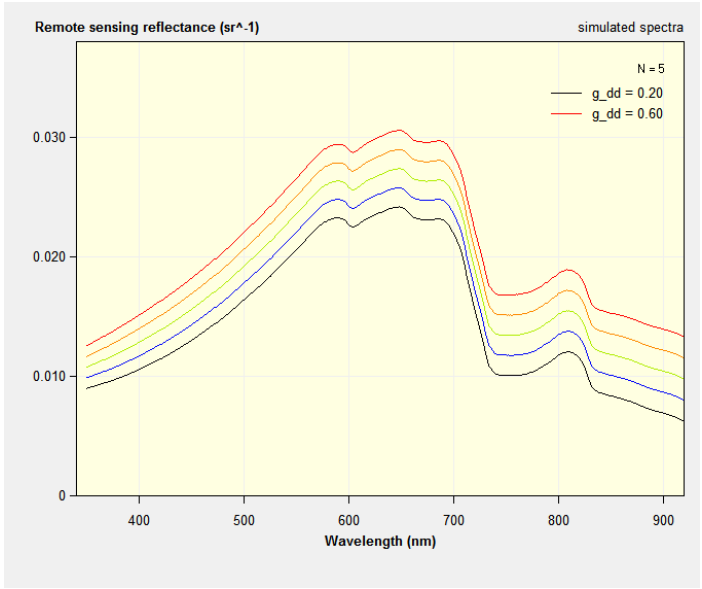
VGL_RRS | 22.1.2019

Results
NIR signature

Missing range 820–900 nm would allow better separation of C_X and g_dd

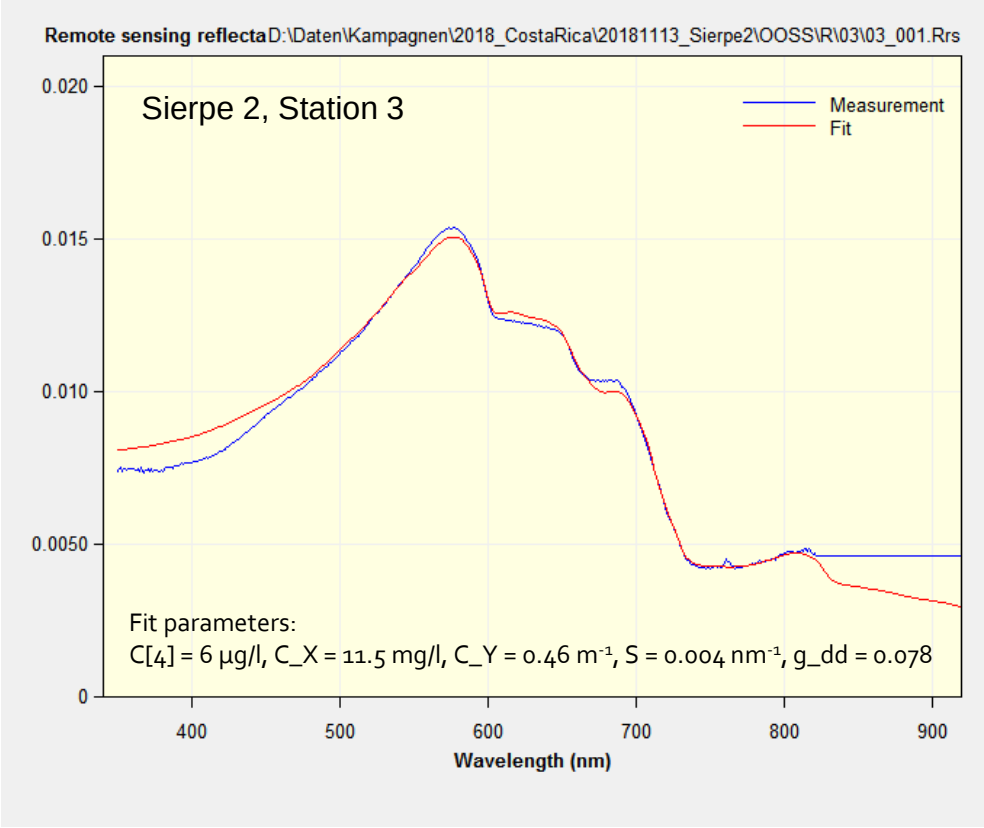


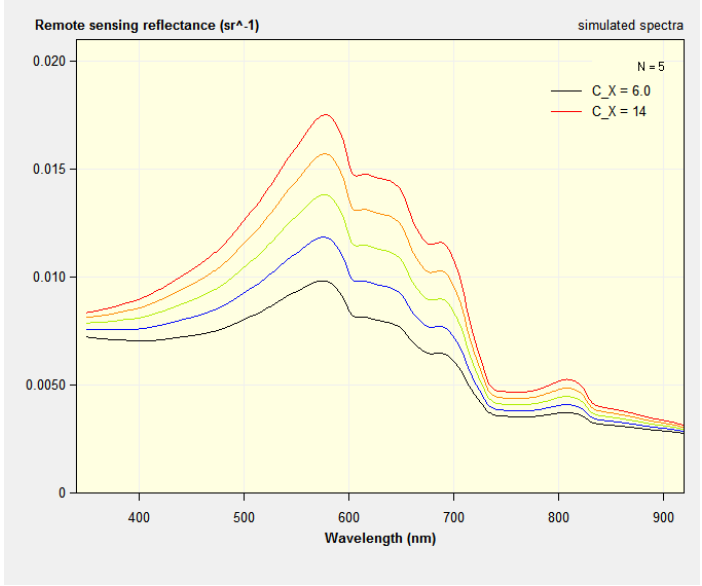


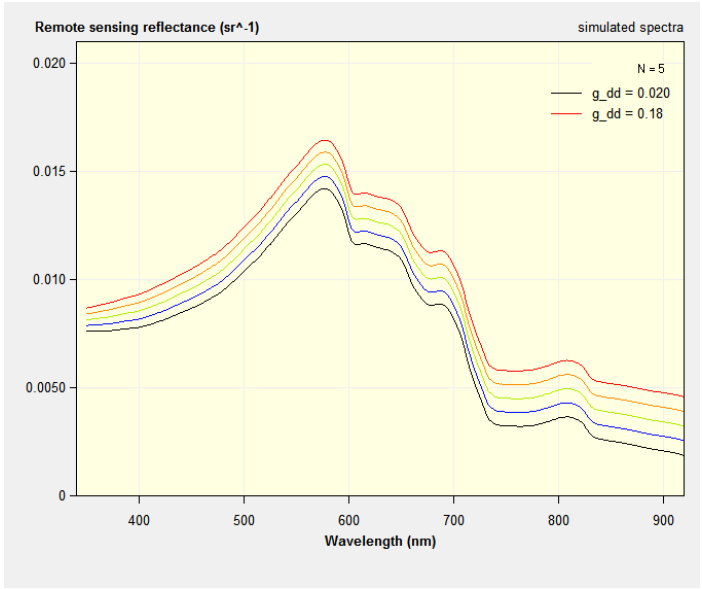


Results
NIR signature

C_X affects scaling
g_dd adds offset







Results
NIR signature

Very good fit of range > 700 nm